



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/700,525	11/05/2003	Masanari Furiki	H6808.0027/P027	5936
24998	7590	06/14/2005	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP 2101 L Street, NW Washington, DC 20037			SOUW, BERNARD E	
		ART UNIT	PAPER NUMBER	
		2881		

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/700,525	FURIKI ET AL.	
	Examiner	Art Unit	
	Bernard E. Souw	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 24 November 2004.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-7 and 9 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-7 and 9 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 05 November 2003 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1.) Certified copies of the priority documents have been received.
 2.) Certified copies of the priority documents have been received in Application No. _____.
 3.) Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Reopen Prosecution - After Notice of Allowance

1. Prosecution on the merits of this application is reopened on claims 1-9 considered unpatentable for the reasons indicated below:

- ▶ Claims 1, 2, 5, 7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Funatsu et al. (USPAT 6,566,654).
- ▶ Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Funatsu et al.
- ▶ Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Funatsu et al.. in view of Nishino et al. (USPAT 5,030,319).
- ▶ Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Funatsu et al. in view of Nishiyama et al. (USPAT 6,618,850).
- ▶ Claim 8 having been canceled, the previous objection is now moot.

Reopen Prosecution - Vacate Notice of Allowance

2. Applicant is advised that the Notice of Allowance mailed 11/30/2004 is vacated. If the issue fee has already been paid, applicant may request a refund or request that the fee be credited to a deposit account. However, applicant may wait until the application is either found allowable or held abandoned. If allowed, upon receipt of a new Notice of Allowance, applicant may request that the previously submitted issue fee be applied. If abandoned, applicant may request refund or credit to a specified Deposit Account.

Amendment

3. The Amendment filed 11/24/2004 has been entered. The present Office Action is made with all the arguments being fully considered.

Claim 8 has been cancelled.

Claim 5 has been amended

Claims 1-7 and 9 remain pending in this office action.

Claim Objection Moot

4. Claim 8 having been canceled, the previous objection is now moot.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 2, 5, 7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Funatsu et al. (USPAT 6,566,654).

Regarding claims 1, 5, 7 and 9, Funatsu et al. disclose a charged particle beam (CPB) apparatus system, as shown in Fig.5 and recited in the Abstract, Col.1/II.42-65 and Col.2/II.15-55, comprising a circuit pattern inspection apparatus 60 that irradiates a charged particle beam 62 on a plurality of areas of a circuit pattern 65, more detailed in

Art Unit: 2881

- Figs.7A, 7B and 9, as recited in Col.4/II.14-32, detects secondary charged particles generated from the circuit pattern to form images of the irradiated areas 106 and compares the images of the plurality of areas to thereby detect a defect or a foreign-particle in the circuit and a charged particle beam apparatus that is used for observation or analysis of the defect specified by means of the pattern inspection apparatus, as recited in Col.4/II.33-38, wherein carbon-base deposit is formed on the irradiated area as the result of interaction between the charged particle beam and gas that is remaining in the circuit pattern inspection apparatus or generated from the sample, as recited in Col.5/II.47-59, and the charging or deposit is used as a mark 107 in the charged particle beam apparatus of Fig.5, as shown in Figs.7B and 9 and recited in Col.5/II.66-67 and Col.6/II.1-54.

Regarding claim 2, Funatsu's CPB apparatus is facilitated with a gas introduction mechanism 51 for spraying gas onto the circuit pattern 106 shown in Fig.9, as recited in Col.5/II.60-65.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Funatsu et al.

Funatsu et al. show all the limitations of claim 6, as previously applied to claims 1 and 5, except the recitation that the semiconductor device with marked circuit pattern is transferred to a second CPB apparatus for irradiation.

Since applicant has not disclosed that the second irradiation solves any stated problem or has any particular purpose and it appears that the invention would perform equally well with Funatsu's first irradiation for marking the defects. Therefore, Applicant's use of a second CPB apparatus for an unspecified irradiation is a mere matter of design choice that is unpatentable, because it only involves routine skill in the art.

Furthermore, the court held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to transfer Funatsu's semiconductor device with marked circuit pattern to a second CPB apparatus for irradiation, in order to further process the semiconductor device, e.g., repair the marked defects, without first exposing the device to ambient air.

One of ordinary skill in the art would have been motivated to modify Funatsu's system by adding a second CPB irradiation system for continued processing of the marked defects without first exposing the device to ambient air, since air exposure is in many cases undesirable.

One of ordinary skill in the art would have been motivated to modify Funatsu's system by adding a second CPB irradiation system for continued processing of the marked defects without first exposing the device to ambient air, in order to save time and work, thus increasing the throughput.

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Funatsu et al.. in view of Nishino et al. (USPAT 5,030,319).

Funatsu et al. show all the limitations of claim 3, as previously applied to claims 1 and 5, except the recitation of a cooling unit for cooling the circuit pattern to be marked.

As a matter of fact, Funatsu's gas spray provision is simultaneously also a cooling unit, since the sprayed gas is normally has a lower temperature. However, a cooling unit to cool the circuit pattern is also advised by Nishino et al., which disclose a surface processing apparatus similar to Funatsu's, as shown in Fig.1 and recited in Col.7/II.59-68 and col.8/II.1-21, thereby also reciting that the CPB activates the gas to decompose and deposit on the substrate, as recited in Col.12/II.64-68, and that the amount of the deposit would be increased by cooling the substrate, as recited in Col.16/II.22-25.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to equip Funatsu's apparatus with an extra cooling unit to cool the circuit pattern, in order to increase the amount of Funatsu's carbon deposit, as taught by Nishino et al. in Col.16/II.22-25.

One of ordinary skill in the art would have been motivated to modify Funatsu's apparatus by adding an extra cooling unit as suggested by Nishino et al., since an increased amount of carbon deposit would enhance the visibility of the defect's marking, thus helping the operator in the next processing steps.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Funatsu et al. in view of Nishiyama et al. (USPAT 6,618,850).

Funatsu et al. show all the limitations of claim 3, as previously applied to claims 1 and 5, except the recitation of charging the circuit pattern by the CPB to mark the defect(s). Nishiyama et al. disclose in Figs.27-29 a method for defect detection of a circuit in which a CPB is scanned over the circuit to form an image of secondary electrons, wherein the defects in the circuit are charged differently than the intact parts, and thus, can be detected by voltage contrast method, as recited in Col.15/II.59-67 and Col.16/II.1-7.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to detect circuit defects in Funatsu's apparatus by making use of the different charging of the defects as compared to the intact parts of the circuit, as taught by Nishiyama et al., since no extra provision is thereby needed, such as gas supply in a gas decomposition - carbon deposit method.

One of ordinary skill in the art would have been motivated to modify Funatsu's defect detection by Nishiyama's voltage contrast method, since no cleaning of residual

deposit is needed after the process has been finished, thus saving time, work, as well as additional equipment.

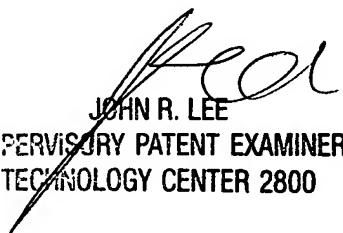
Communications

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 571 272 2482. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571 272 2477. The central fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications as well as for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

bes
June 01, 2005


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800